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# Index to FAA Office of Aerospace Medicine Reports: 1961 Through 2002 *Introduction*

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## Foreword

# INDEX TO FAA OFFICE OF AEROSPACE MEDICINE REPORTS: 1961 THROUGH 2002



*Staff members gathered in front of the CAMI Building in October 2002 to observe the 40th anniversary of the building's opening (October 21, 1962).*

**T**HE CIVIL AEROSPACE MEDICAL INSTITUTE, CAMI, is the medical certification, research, education, and occupational health wing of the Federal Aviation Administration's Office of Aerospace Medicine (OAM).

Our mission has not changed over the years: Our only purpose is to *further aviation safety*.

At CAMI, we study the factors that influence human performance in the aviation environment, find ways to understand them, and communicate that understanding to the aviation community.

Communicating research findings to the public is achieved in several ways: published reports in professional journals and newsletters, proceedings reports, and formal technical reports.

*OAM Reports* is the major part of the communications effort. Published continuously since 1961, these reports are the distillation of FAA aeromedical research efforts in aviation safety.

To date, we have published 947 reports on a wide range of subjects, from *Angular Acceleration* to *Workload Effects on Complex Performance*.

The *Index* is provided as a reference for those engaged in aviation medicine and related disciplines. We do so because sharing significant findings contributes to the body of aeromedical knowledge through the synergistic effects of others, leading to understanding and the application of appropriate solutions.

## SOME OBSERVATIONS ON THE ORIGINS OF THE CIVIL AEROSPACE MEDICAL INSTITUTE (CAMI): ITS FIRST PREDECESSOR, THE CIVIL AEROMEDICAL RESEARCH INSTITUTE (CARI)

By William E. Collins, Ph.D., and Stanley R. Mohler, M.D.

The following vignette was created by Myrna Johnson during 1966. On October 3, 1960, Ms. Johnson joined CAMI (then CARI) as a receptionist and later served as a budget analyst for Mr. Vaughan E. Choate; the Institute's Administrative Officer. On her own initiative and based on her own sense of history ("all organizations have a history and it should be recorded"), Ms. Johnson undertook the writing of this piece during her last few months at the Institute.

The special section on the Institute's library has some roots in the fact that her husband, who had twice been a part-time employee of the Institute as an editorial clerk/writer (June 1961-September 1962; June-September 1963) while he attended graduate school at the University of Oklahoma, helped set up the library prior to the hiring of the first official librarian.

Ms. Johnson completed the manuscript in July 1966, just prior to her leaving the Institute (August 26, 1966) for Texas where her husband had secured a teaching position following completion of his Ph.D. degree. The text of the article, which is referenced as a "mimeograph" under a slightly different title ("Civil Aeromedical Research Institute – A Brief History, 1959-1966") in Heber Holbrook's 1974 *Civil Aviation Medicine in the*

*Bureaucracy*, is presented below exactly as written. What is not presented is a listing appended by Ms. Johnson, of every federal research employee of the Institute during the period covered along with their job titles, grades, dates they joined the Institute, and for those who left, a date and a one-word description of the reason for leaving. All of the latter data are now available in the CAMI Library.

Ms. Johnson's focus is on the original function of the Institute – research – and, as such, there is no detailing of personnel who came to occupy non-research positions (e.g., in aeromedical certification) as organizational changes (which she notes) took place. Also, when the name (and functions) of the Institute changed to the Civil Aeromedical Institute in late 1965, she uses the acronym CAI for the organization's new title; the acronym became CAMI shortly after she left in 1966 and has been preserved to identify the Institute with its new name – The Civil Aerospace Medical Institute – authorized in 2001 to reflect the FAA's responsibilities associated with the commercial space transportation program.

With Ms. Johnson's permission, we have taken one liberty with her article, i.e., we have added archival photographs that supplement the text.



**A rare grouping of key figures in the CARI story.** Pictured in the northeast corner of the CARI lobby in 1963 are (l to r) Heber Holbrook (Administrative Officer in Aeromedical Certification and later author of "Civil Aviation Medicine in the Bureaucracy"), J. Robert Dille, M.D. (CARI Program Advisory Officer – next CARI Director), Peter V. Siegel, M.D. (Chief of Aeromedical Certification – the next Federal Air Surgeon), M.S. White, M.D. (Federal Air Surgeon, September 1963-September 1965 and the first to hold that title – it had previously been "Civil Air Surgeon"), Stanley R. Mohler, M.D. (CARI Director), and Vaughan E. Choate (CARI Administrative Officer).

## CIVIL AEROMEDICAL RESEARCH INSTITUTE, 1959 – 1966

By Myrna Johnson

July 1966

From its beginning in 1959 until in October 1965, the research facility in Oklahoma City has been called the Civil Aeromedical Research Institute, CARI, for short. To those who were CARI employees during this period of time, the Institute will be remembered as CARI. The purpose of this history is to sketch the growth of this institution.



*Ms. Johnson*

The Federal Aviation Agency announced on October 31, 1959, plans for the Civil Aeromedical Research Center, later called Civil Aeromedical Research Institute (CARI), to be established at the Aeronautical Center in Oklahoma City, Oklahoma. The purpose of the new medical research center was to develop medical data to meet the problems of civil air operations as civil aviation moved into higher altitudes and supersonic speeds (1).

Late in December 1959, the first CARI personnel arrived in Oklahoma City. John Swearingen, J.D. Garner, Ernest B. McFadden, and John Blethrow had been with the Civil Aeronautics Medical Research Laboratory (CAMRL) in Columbus, Ohio. Dr. Robert T. Clark arrived from the School of Aviation Medicine (SAM) in San Antonio, Texas, to become CARI's Director of Research. The first home of CARI was the second floor, Hanger 8 at the Aeronautical Center. In February 1960, a group of researchers and other staff members arrived at

CARI from SAM. This group was comprised of Dr. Jess McKenzie, physiologist; J.D. Allred, audio visual specialist; Dr. Bruno Balke, biodynamics; Dr. James Green, biochemist; Dr. P.C. Tang, neurophysiologist; Aline "Corky" Koch, secretary; M.C. Oviatt, engineering technician; and Claude Jones, administrative officer. During the spring and summer, staff members continued

to arrive. Dr. George Hauty, Rollo Beebe, and Bart Cobb, all in psychology, came from SAM.

In April, Dr. Michael T. Lategola, physiologist, arrived. Dr. Don H. Estes joined the staff in July as the Director of CARI. Vaughan E. Choate became the executive officer in July. Drs. P.F. Iampietro and L.J. O'Brien, physiologists, joined the staff in August. Howard Hasbrook, crash injury specialist, arrived in September. In the last four months of the first year, Dr. Wallace Friedberg, physiologist; Dr. William Stavinocha, pharmacologist; Dr. Richard Snyder, anthropologist; and Dr. E.E. Phillips, physiologist, joined the staff.

The main efforts during the first year were spent in setting up the laboratories and recruiting researchers and technicians. Several moves were accomplished during the first six or seven months. In May 1960, the small group moved from Oklahoma City to Building 604, North Campus, Norman. This building was part of the



*The "gym" on the North Campus of the University of Oklahoma in Norman, Okla., housed biodynamics and related research by CARI scientists in 1960-1962. The several buildings occupied by CARI personnel had been temporary U.S. Navy buildings during World War II.*



University of Oklahoma Research Institute. In August, the group moved again into Building 803, Building 805, and a gymnasium, which were leased from the University of Oklahoma. Three more buildings were acquired later. The institute remained in these quarters until it moved into new facilities at the Aeronautical Center in October 1962.

The Bureau of Aviation Medicine in Washington, D.C., was established on March 14, 1960 – an indication of the growing significance of the medical program in aviation safety. CARI researchers concentrated on the following projects during the next three months:

1. Man's aging process and the relation to chronological age and pilot proficiency;
2. Selection criteria for and environmental stress factors experienced by air traffic controllers; and
3. Inflight fatigue affecting flight engineers on jet aircraft (2).

At the end of the first year, the staff consisted of a Director, Director of Research, 18 researchers, 4 secretaries, a receptionist, an executive officer, an administrative officer, a supply specialist, and 20 technicians and scientific aides. Each branch had several members, and the audio visual and engineering services were functioning.

During FY 1961 the accomplishments were three-fold: design of the new facility, recruitment of key staff; and initiation of long-range research programs.

The second year was marked by several significant developments and continued growth. The first major change occurred in April 1961, when Drs. Estes, Clark, and Green and several technicians resigned or transferred.

Dr. Hauty served as Acting Director of CARI until the appointment of Dr. Stanley R. Mohler as Director in August 1961. On September 20, 1961, the staff consisted of 89 members, including temporary and part-time workers. The authorized permanent staffing was 64, authorized temporary 18, and authorized part-time 20. Listed below is the staffing by branches and services:

10: Director's Office	1: Library
8: Biochemistry Branch	2: Animal Care
6: Branch Chiefs	5: Research Engineering
17: Psychology Branch	6: Biodynamics Branch
2: Clinical Examination	6: Audio Visual
4: Environmental	3: Neurophysiology
Physiology Branch	Branch
6: Employee Health	2: Biometrics
11: Protection & Survival	
Branch	

Branch secretaries were added in October and November 1961.

Plans originally called for a staff of several hundred in five years or less. However, growth was limited by a congressional ceiling on staffing. The budget prepared in June 1960 for 1961 and 1962 requested 61 positions for 1961, which were within the limit, and requested 150 additional positions over the ceiling. For 1962, 320 positions were requested. Seventy-five positions were authorized for 1962, and this authorization still holds for Research and Development (FY 1966).

At the end of 1961, 18 professional researchers, 7 secretaries and clerks, and 21 technicians and scientific aides had joined the staff in its second year. Part-time employees are included in these numbers.

During FY 1962, 13 CARI reports and 45 scientific articles were published. Research developed methods of predicting success of air traffic controllers in training. The investigations of air crashes furnished information for improvements in air safety. Preliminary work was completed on toxic hazards in aerial application of insecticides.

In June 1962, decentralization of the Washington office occurred, and Certification and Standards Divisions moved to Oklahoma City. The new organization was headed by Dr. George Steinkamp, Deputy Civil Air Surgeon for Research and Operations. CARI, Georgetown Clinical Research Institute, and Research Direction became a part of the Aeromedical Research Division, one of the four divisions, and the Clinic became Aeromedical Clinical Services Division. The remaining two divisions were Aeromedical Certification Division and Aeromedical Standards Division. In December, the Office of the Deputy Civil Air Surgeon was abolished, and the 15 positions given to CARI and Certification. Standards Division moved back to Washington in November 1963.

The major event in FY 1963 was the move in October 1962 into the new \$8.5 million research facility at the Aeronautical Center. On October 21, the building was dedicated by FAA Administrator N.E. Halaby (3).

In FY 1963, the staff reached full strength with 35 professional research scientists, 25 research scientists, 15 scientific aides, and 20 part-time aides. In Research Direction, 11 were in the Office of the Director, and



*Dr. Estes*



*Mr. Halaby*



there were six branch chiefs and six branch secretaries. During this year, CARI participated in the supersonic program and Project "Little Guy," in addition to the approved projects. Thirty-five CARI reports and one Technical Publication were issued.

With the move into the new building completed and the labs set up and working, the new facility allowed new projects to be undertaken in FY 1964. Experiments were conducted in the altitude, pressure, and environmental chambers. Ditching, evacuation, and rescue experiments were conducted in the pool. Drug, alcohol, and decompression studies were made at high altitudes. Tests of oxygen masks were conducted. Twenty OAM reports (13 from Georgetown and seven from CARI) were published during this year.

The major projects were retitled in FY 1965 to more clearly describe the medical research program at CARI. Thirty-three professional research scientists, 30 research scientists, 12 scientific aides, and 20 part-time positions were abolished. Thirty-two OAM reports were issued during this year.

During FY 1966, the first major turnover of personnel occurred. Sixteen members of the scientific staff left during this year. Their vacancies were filled with scientific aides. Highlights of FY 1966 included 24 OAM reports, 23 presentations by staff members at various meetings, and 14 papers published in open scientific literature. Late in FY 1966, the Federal Air Surgeon announced the move of [the] Georgetown [facility] to Oklahoma City. This added 25 more researchers and aides to the research program in Oklahoma.

During CARI's existence, CARI has maintained a good relationship with the University of Oklahoma, the OU Medical School, and the communities of Norman and Oklahoma City. Students at OU and the medical schools have worked with CARI scientists, and many of CARI's researchers have had faculty status at OU and the medical school.

### Organization

When CARI was established, there were six branches and the Office of the Director, Audio Visual Service, and Research Engineering. Animal Care was added later. The branches and branch chiefs were

- Biochemistry – Dr. James Green;
- Biodynamics – Dr. Bruno Balke;
- Environmental Physiology – Dr. P. F. Iampietro;
- Psychology – Dr. George T. Hauty;
- Protection & Survival – Mr. John Swearingen; and
- Neurophysiology – Dr. Pei Chin Tang.

As mentioned previously, the first change occurred in April 1961 when Dr. Estes transferred to Washington, and Dr. Clark and Dr. Green resigned to take academic appointments. The Director of Research position was abolished. Biochemistry Branch became Pharmacology-Biochemistry, and Dr. Paul Smith became its new chief. In August, Dr. Mohler became CARI's second director and remained in that position until December 1965, when he transferred to the Office of Aviation Medicine in Washington, D.C.

In September 1964, Dr. Balke took an academic position, and Dr. Lategola became the Acting Chief of Biodynamics. In FY 1964, the six branches were changed to laboratories, and in January 1965, the Neurophysiology and Biodynamics Laboratories were dissolved and the personnel absorbed by the remaining four laboratories.

In September 1965, Dr. Hauty resigned to become a department head at an Eastern university [and] Dr. William E. Collins became the new Psychology Laboratory chief.

From CARI's beginning in 1959 to the present time, the Washington organization has changed from time to time, and consequently affected CARI's operation and organization. From 1960 to 1962, CARI was under the Research Requirements Division in Washington. In June 1962, the Office of the Deputy Civil Air Surgeon for Research and Operations was moved to Oklahoma City, and CARI and Georgetown came under the Aeromedical Research Division in this new organization. Dr. Mohler, in addition to continuing as Director of CARI, was the Division Chief of the Aeromedical Research Division from July 8, 1962, until January 2, 1964. In January 1964, CARI came under the Aeromedical Education and Research Division in Washington. Dr. Romney Lowry was the new division's chief. In October 1965, the medical activities at the Aeronautical Center (Certification, CARI, and the Clinic) were reorganized into one division entitled the Civil Aeromedical Institute (CAI). In December, Dr. J. Robert Dille became the new division chief. Dr. Dille had been Program Advisory Officer for CARI from June 1961 until February 1965, when he was transferred to the Western Region as Flight Surgeon. CAI no longer has direct contact with Washington but is under the Director of the Aeronautical Center. There are four branches and the Office of the Division Chief in the new



*Dr. Mohler*



*Dr. Dille*

organization. The branches are Administrative and Technical Branch, Aeromedical Certification Branch, Aeromedical Research Branch (formerly CARI), and Aeromedical Services Branch.

The latest reorganization or change is the move by Georgetown to Oklahoma City, to be accomplished by September 30, 1966. In August, Dr. Harry L. Gibbons will become chief of the Aeromedical Research Branch.

### **CARI Library**

A research facility needs a library and CARI was no exception. Early in CARI's history, beginning steps were taken to obtain a library. A library committee was established, and Dr. Jess McKenzie became its first chairman. The original purpose of the committee was established to oversee the entire library functions. Dr. Larry J. O'Brien arrived at CARI in August 1960 and was appointed the committee chairman.

With the establishment of the library committee, the first step was taken. At first, the incoming subscriptions were passed from desk to desk. The receptionist checked in the journals and books as they arrived in the mail. In June 1961, Bobby H. Johnson, a part-time editorial clerk, handled the library materials and set up an efficient operating library. Two rooms of Building 803 became the first library.



*Miss Heck*

In March 1962, Miss Lilah B. Heck, medical librarian at the University of Oklahoma Medical School, became the first CARI librarian. At this time, the library moved into Building 802 and occupied four rooms (1,175 sq. ft.). With the additional space, there was a library of-

fice, a current journals and general reference room, a room for bound periodicals and book stacks, and a photo duplication room. New shelving, reading tables, reading carrels, and duplicating equipment were added.

In FY 1962, the funding responsibility for the librarian, furnishings, and physical appointments was given to the Aeronautical Center library, but the books, subscriptions, and other needs came from medical funds. The function of the committee was changed because of this policy. Instead of overseeing all functions of the library, the committee became representatives of

the staff to decide how the budget would be spent for books and journals. In August 1962, Dr. O'Brien accepted an academic appointment and left CARI, and Dr. Carlton Melton became the new chairman.

In October 1962, the library moved into its spacious new home. At first, it occupied rooms 256 and 379. Bound periodical stacks, current periodicals, reference books, patron's work space, and charge desks were on [the] second floor. The book stacks, card catalog, and the library staff's workroom were on [the] third. This move was not final by any means. Office space was required on [the] third floor, so the book stacks were moved to the basement. Later, partitions were removed from the back part of the second floor library, and the stacks were moved to second floor. Finally, all the library was on a single floor.

In June 1965, Miss Heck retired because of poor health, and Mrs. Alfreda Hanna became the new librarian. Mrs. Hanna resigned in February 1966 because of the lack of library help, and Ted Goulden became the third librarian.



*Ms. Hanna*



*Mr. Goulden*

The present library committee is comprised of Drs. Melton, Crane, Tobias, McKenzie, Fiorica, Davis, John Ice, and Ted Goulden.

The main problem of the library at the present time is to stay within the assigned library space. The library is growing at the rate of 30 shelf-inches a week. The library budget is another problem. An equipment ceiling in the past couple of years has held the purchase of books and back issue journals to a minimum.

### **Footnotes**

1. "Federal Aviation Agency Historical Fact Book: A Chronology, 1926-1963," P. 45, 1966.
2. *Ibid.*, p. 47.
3. *Ibid.*, p. 60.

## HOW TO USE THE INDEX

The Index is organized in three sections:

1. **Chronological Index:** A cumulative list of all research reports from 1961 through 2002.
2. **Author Index:** All contributing authors, in alphabetical order.
3. **Subject Index:** Subjects, listed in alphabetical order.

Some examples are:

02-15 Lewis RJ, Johnson RD, and Canfield DV: An accurate method for the determination of carbon monoxide in postmortem blood using GC/TCD.

**Above:** This is an entry from the **Chronological Index** of research reports, shown in cumulative sequence.

Prinzo OV ----- 93-20, 95-15, 96-10, 96-20, 96-26, 98-17,  
98-20, 01-8, 01-9, 02-5.

**Left:** This is an entry from the **Author Index**, which lists all of the research reports prepared by an author or co-author.

### **Human factors (also see: Performance)**

...accident reporting system — Human Factors Analysis  
and Classification System, 00-7.  
...air traffic control operational errors/deviations, role of  
shiftwork and fatigue, 99-2.

**Left:** An example of entries in the **Subject Index**; refers to all reports that pertain to a specific topic.

## REPORT NUMBERS

01-2 McLean GA: Access to egress: A meta-analysis of the factors that control emergency evacuation through the transport airplane Type-III overwing exit. PB2001104655

**Above:** The first numbers (01-2) refer to the year and chronological number of the report. This is an abbreviated portion of the official number given each report and is found in the upper left of the report's cover page. The full report number of "01-2" is DOT/FAA/AM-01/2. The "PB2001104655" is appended to the report by the National Technical Information Service. Keep the number system in mind when ordering.

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